

## **Descriptions of Additional Supplementary Files**

### **Supplementary Data 1**

**Description:** The bidirectional probability of direct transmission between any two patients.

### **Supplementary Data 2**

**Description:** The number of intermediates between any two patients.

### **Supplementary Data 3**

**Description:** The acknowledgement table of viral genomes used in this study.

### **Supplementary Data 4**

**Description:** The clinical information of patients from which viral genomes used in this study were derived.

### **Supplementary Data 5**

**Description:** The parameters of offspring distribution estimated by using different phylogeny.